

# Exploring the Feasibility of Implementing a Supervised Exercise Training and Compression Hosiery Intervention in Patients with Venous Ulceration: A Case Study

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## INTRODUCTION

Over 180,000 people in the UK suffer from venous leg ulcers; it is a major health problem (Whiteley, 2013). A leg ulcer is defined as a break in the skin of the leg which has not healed after 4-6 weeks (Morris & Sander, 2007). What can start out as a minor knock (often on something like a supermarket trolley) can potentially turn into a leg ulcer if the veins in the legs have difficulties pumping blood back to the heart.

Leg Ulcers can be very painful, impair mobility, and reduce quality of life and self esteem. They are a chronic problem with 26% recurring in the 1<sup>st</sup> year (Morris & Sander, 2007). Treatment of venous ulcers costs the NHS between £400,000 - £600,000 annually (Whiteley, 2013).

Exercise training offers a financially viable adjunct to compression hosiery in the prevention and treatment of venous ulcers, via favourable effects on lower-limb blood flow and vascular function (Davies et al, 2008). Despite the potential benefits, the combined effect of exercise and compression has not yet been examined and the Royal College of Nursing is requesting for more studies to be undertaken in this area.



## AIMS AND OBJECTIVES

Before embarking on a definitive randomised controlled trial, we are conducting a smaller scale feasibility study to understand if supervised exercise training and compression therapy versus compression therapy only, is feasible in patients with venous ulceration.

The study aims to explore the acceptability of an exercise programme in patients with venous ulcers through qualitative evaluation (i.e. direct patient experience of the intervention) and quantitative evaluation (i.e. compliance). The study will also be looking at other potential outcome measures such as healing rate, healing time, ulcer recurrence, infection incidences, quality of life, costs and cost-effectiveness.

## METHODS

The study is a two-centre, two-arm, parallel-group, randomised trial. Patients with diagnosed venous ulcers are randomised 1:1 either to a 12-week supervised exercise programme combined with compression stockings or usual care. Outcome measures assessed at baseline include cardiopulmonary fitness, health-related quality of life, ulceration size and microvascular function. The assessments are then repeated at a 12 week and 1 year follow-up. Semi-structured interviews are conducted with a sub-sample to explore participants experiences of the study.

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## EXERCISE INTERVENTION

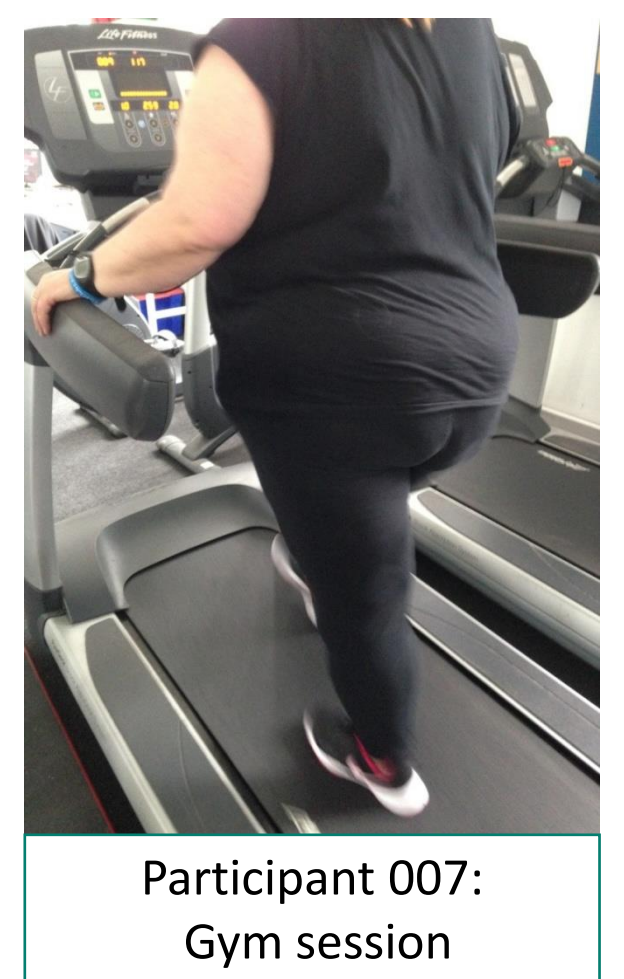
Frequency: 3 sessions per week for 12 weeks

(At Sheffield Hallam University or the University of Lincoln).

Intensity: Low-to-moderate (Guided by Borg's 6-20 exertion scale).

Time: 60 minutes (Progressive)

Type: Aerobic component: Treadmill hill walking and or cycling.  
Strength component: Lower limb resistance exercises, for example calf raises.  
Flexibility component: Static stretches for all the major muscle groups of the legs.



Sustainability: At the end of the 12 week programme participants will receive a Home Exercise Programme to follow.

## RESULTS

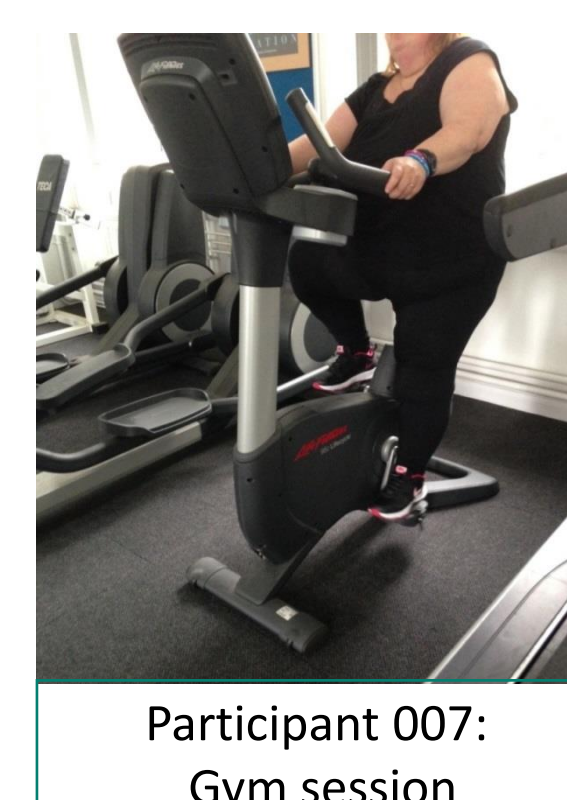
Participant 007		
Measure	Baseline	12 Week Follow Up
Diagnosis	Open	Healed
Size of Ulcer	1.9 cm	0.6cm
Calf Circumference	51 cm	45 cm
Ankle Circumference	40 cm	36cm
Ankle Range of Motion	55°	67°
Type of Compression	Bandaging	Hosiery
Weight	151kg	144kg
Fitness Test		
30s Chair-Stand	10 reps	14 reps
6-Min Walk	330 m	400 m
Chair Sit & Reach	-20	-17

"...my friend who I bumped in to down the Moor, well she couldn't believe how much weight I had lost"  
(Participant 007)

"falling over in town, it was hard to get me up but now you know my balance is better since the programme"  
(Participant 007)

## RECOMMENDATIONS

○ Postal invitations yielded a low response rate. To establish an effective referral pathway the study team needs to build strong relationships with Tissue Viability Nurses and recruitment staff require regular face to face contact with the population group.



○ Study criteria must not be too restrictive. This study has been amended so leg ulcers older than 12 weeks are now eligible; this has increased the pool of potential participants.

○ Positive results from this study indicate that a combined treatment of compression therapy and exercise has been effective.

## ACKNOWLEDGMENTS

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## REFERENCES

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Whiteley, M. (2013) Leg Ulcers - Twice the Problem They Should Be. [Online] Available from: [http://www.huffingtonpost.co.uk/mark-s-whiteley/leg-ulcers-twice-the-problem\\_b\\_2829584.html](http://www.huffingtonpost.co.uk/mark-s-whiteley/leg-ulcers-twice-the-problem_b_2829584.html) (Accessed 05/08/15).  
Davies J, Bull R, Farrelly I, Wakelin, M (2008) Wounds UK. Improving the calf pump using home-based exercises for patients with chronic venous disease. [Online] [http://www.woundsinternational.com/media/issues/183/files/content\\_147.pdf](http://www.woundsinternational.com/media/issues/183/files/content_147.pdf).